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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,198	08/21/2006	Michiyo Hirayama	10873.1936USWO	1087
53148 7590 12/22/2009 HAMRE, SCHUMANN, MUELLER & LARSON P.C. P.O. BOX 2902-0902 MINNEAPOLIS, MN 55402				
EXAMINER				
GUPTA, VANI				
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3768				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/598,198

**Applicant(s)**

HIRAYAMA ET AL.

**Examiner**

VANI GUPTA

**Art Unit**

3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 24, 2009 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

### ***Inventorship***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. *Claims 1 – 12 are rejected under 35 USC 103(a) as being obvious over Kunii et al. (US 4,181,120) in view of Drinkwater et al. (US 2004/0254470 A1).*

*Regarding Claim 1*, Kunii discloses an ultrasonic probe assembly comprising:

- a. Ultrasonic device that transmits and receives ultrasound (fig. 3a, 34);
- b. A frame that supports the ultrasonic device/transducer that supports, or holds the ultrasonic transducer (*fig. 3a, 34*);
- c. A window, or *acoustic lens*, that is coupled with the frame so as to surround the ultrasonic device (*fig. 3a, 24*); and
- d. an ultrasound propagation medium, or acoustical coupling medium, with which a space surrounded by the frame and the window is filled (*33*), wherein:
  - i. the ultrasonic device is accommodated in a space that is surrounded by the frame and the window and that is filled with the ultrasound propagation medium (fig. 3a), wherein *transducer (34)* is surrounded by *fluid (33)*, all disposed within *vessel body (31)* of ultrasonic probe;
  - ii. the window comprises a metal portion, wherein a part of the metal portion being embedded in an inside of the resin portion and another part being exposed to an outside of the resin portion (*22*), and that the coupling of the window (*24*) and the frame is implemented by coupling the part of the metal portion exposed to the outside of the resin portion with the frame (*fig.2a; col. 3, lines 27 – 38*).  
Additionally, the metal portion comprising “metal ring” (*32*) is exposed to the outside of the resin portion with the frame at a position opposed to a peripheral

portion of the frame. That is, the sides of the probe comprising a part of the metal portion are not surrounded by the resin (*fig. 3a*).

However, Kunii differs from Claim 1 in that he does not specifically disclose that metal portion directly couples the frame to the window portion.

Nonetheless, Drinkwater discloses (*Figure 2*) metal portion(s) **16** and **18** supports the frame (**12**). In turn, resin portion (**28**) acts as a “window” and is coupled to the frame (**16** and **18**). Therefore, the frame is directly connected to the window.

Accordingly, it would have been prima facie obvious to modify Kunii with the teachings of Drinkwater to include the arrangement between the frame (12) and metal portions (16 and 18), to provide better support to the probe assembly.

**Regarding Claim 2**, as indicated by the specification of the present application, the resin portion (**5b**) is allowed to get into the apertures of the metal portion, which means that coupling force between the metal portion and the resin portion can be increased (*paragraph [0034]*). Drinkwater explains the coupling element together with the metal portion serve to define the transducer cavity (*paragraph [0037]*). Furthermore, Drinkwater shows that within the contact footprint (**50**) of the resin portion (**28**), lays the “array aperture.” Here, the contact foot print is large enough to “wholly contain the [ultrasound transducer] array aperture” (*Drinkwater, paragraph [0042]*). Therefore, at the time of the invention, one of ordinary skill in the art could safely conclude that the in the case of Drinkwater's arrangement, the resin portion is an integral part of the metal portion.

**Regarding Claims 3 and 5**, Drinkwater teaches a convexo-concave structure provided at the metal portion at the part embedded in the inside of the resin portion (**Figure 3**).

**Regarding Claim 4**, Drinkwater teaches surface-roughening treatment is applied to the metal portion at the part embedded in the inside of the resin portion (*friction material*; **fig. 3, 40**).

**Regarding Claim 6**, Drinkwater teaches that the window is manufactured by insert molding. That is, the metal portion is not likely to be displaced or disengaged from the window portion (*paragraph [0037]*).

**Regarding Claim 7**, Kunii provides a male-shaped part and a female-shaped part are provided at coupling faces of the frame and the part of the metal portion exposed to the outside of the resin portion, and the male-shaped part and the female-shaped part are engaged so as to couple the metal portion and the frame (**fig. 2a and fig. 3a**).

**Regarding Claim 8**, Kunii provides a hook is provided at the part of the metal portion exposed to the outside of the resin portion, and the metal portion and the frame are coupled by latching with the hook (*col. 5, lines 50 – 67*).

**Regarding Claim 9**, Kunii discloses that the metal portion is disposed so as to surround at least a part of the ultrasonic device other than an ultrasound transmission/reception face of the ultrasonic device (**fig. 2a**).

**Regarding Claim 10**, Drinkwater teaches that the resin portion is made of polymethyl pentene, or the like (*paragraph [0044]*).

**Regarding Claim 11**, Kunii discloses that the metal portion is made of stainless steel, or the like (*col. 5, lines 55 – 58*).

**Regarding Claim 12**, Kunii discloses the frame is made of metal (*col. 3, lines 31 – 33*).

***Response to Arguments***

**1. *Applicant's arguments filed November 24, 2009 have been fully considered but they are not persuasive.***

Applicant argues that Kunii et al. fails to teach or suggest an ultrasonic device that is accommodated in a space that is surrounded by a frame and a window and that is filled with ultrasound propagation system.

Examiner respectfully disagrees. Kunii et al. depicts in (*fig. 3a*), wherein *transducer (34)* is surrounded by *fluid (33)*, all disposed within *vessel body (31)* of ultrasonic probe.

Applicant also argues that Drinkwater et al. does not remedy the alleged deficiencies of Kunii et al. Examiner respectfully disagrees.

While Examiner has established Kunii et al. does provided this feature, Examiner will still address this argument. Even though Drinkwater et al.'s transducer is supported by an axle, the transducer is still being “accommodated” or is surrounded by the fluid (*fig. 1* and *fig. 4*).

Applicant argues that that Kunii et al. does not suggest or teach a window that comprises a metal portion including a part that is embedded in an inside of the resin portion and another part that is not covered with the resin portion at a position opposed to a peripheral portion of the frame, as required by claim 1.

Examiner respectfully disagrees and points out that Kunii et al. shows that the metal portion comprising “metal ring” (*32*) is exposed to the outside of the resin portion with the frame at a position opposed to a peripheral portion of the frame. That is, the sides of the probe comprising a part of the metal portion are not surrounded by the resin (*fig. 3a*). Please see above rejection for more details.

Since the claims do not entail features about the “advantages enjoyed [by] helping couple more stably the frame and window and preventing leakage of acoustic propagation medium and suppressing the intrusion of bubbles,” these advantages are irrelevant to the matter at hand. Applicant should note that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues that prior art fails to teach or suggest coupling of the window and the frame being implemented by directly coupling the part of the metal po-on exposed to the outside of the resin portion with the frame, as required by claim 1.

Examiner respectfully disagrees. points out that, as described above, Drinkwater et al. remedies this deficiency as described in (**Figure 2**), wherein metal portion(s) **16** and **18** supports or are directly connected to the frame (**12**). In turn, resin portion (**28**) acts as a “window” and is coupled to the frame (**16** and **18**).

Therefore, present claims are not in condition for allowance.

### ***Conclusion and Communication***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VANI GUPTA whose telephone number is (571)270-5042. The examiner can normally be reached on Monday - Friday (8:30 am - 5:30 pm; EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/V. G./  
Examiner, Art Unit 3768

/Long V Le/  
Supervisory Patent Examiner, Art Unit 3768